

# PATENT ABSTRACTS OF JAPAN

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(54) PUNCHING METHOD OF VACUUM MOLDED FORM

(57)Abstract:

PURPOSE: To form as specified the width

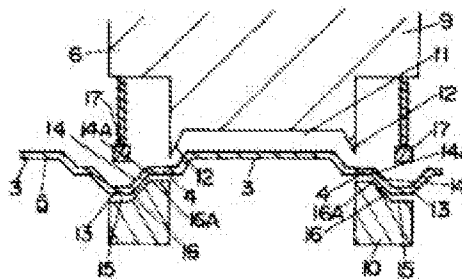
of an edge section formed to the

circumferential section of a molded form by

preventing positional displacement for

punching an intermediate molding section.

CONSTITUTION: A section to be pushed



13 is formed to the circumferential section of an intermediate molding section 3.

An inclined plane 14 for positioning is formed to the section to be pushed 13. A

void 11, in which the intermediate molding section 3 is housed, is shaped to the

top force 9 of a puncher 6. A cutting edge 12 is formed droopingly to the

circumferential section of the void 11. A receiving recessed section 15, in which

the section to be pushed 13 is housed, is shaped to the bottom force 10 of the

puncher 6. An inclined receiving surface 16 having the angle of inclination

approximately equal to the angle of inclination of the inclined plane 14 for

positioning is formed to the sidewall of the receiving recessed section 15. The

section to be pushed 13 faced to the receiving recessed section 15 is pushed by

pushers 17, and the inclined plane 14 for positioning is brought into

surface-contact with the inclined receiving surface 16. The intermediate molding

section 3 is positioned by the coincidence of the upper edge section 16A of the

inclined receiving surface 16 and the upper edge section 14A of the inclined

plane 14 for positioning, and cut by the cutting edge 12.

[Claim(s)]

[Claim 1]With a vacuum molding apparatus, separate a constant interval to a heated resin sheet, carry out vacuum forming of the middle molding part of many molding

shape to it, and an interlayer sheet in which many such middle molding parts were formed is carried in to a punching device, It is how to pierce a vacuum forming article which pierces in a periphery of a middle molding part, forms an edge of predetermined width in a periphery of a middle molding part, and pierces mold goods, A rear part is formed in a periphery of a middle molding part, and an inclined plane for positioning is fabricated by rear part, Carry in to a punching device an interlayer sheet in which a middle molding part was fabricated, and a blank where a middle molding part is stored by punch of a punching device is formed, Hang to a periphery of a blank, the cutting edge is formed, and a carrier crevice which stores a rear part is formed in a bottom part of a punching device, Abbreviate to an angle of gradient of the above-mentioned inclined plane for positioning, are in a side attachment wall of a carrier crevice, and an inclination abutment of an angle of gradient is formed, How to pierce a vacuum forming article pressing with a pusher a rear part which a carrier crevice was made to face, interviewing an inclined plane for positioning in an inclination abutment, and positioning of a middle molding part being made by agreement with rising wood of an inclination abutment, and rising wood of an inclined plane for positioning, and cutting with the cutting edge after that.

[Detailed Description of the Invention]

[0001]

[Industrial Application]About how to pierce the vacuum forming article of a resin sheet, this invention loses a position gap, although a middle molding part is pierced in detail, and it relates to the art of trying to make the width of the edge formed in the periphery of mold goods as predetermined.

[0002]

[Description of the Prior Art]As conventionally shown in drawing 8, with the vacuum molding apparatus 2, separate a constant interval to the heated resin sheet 1, and vacuum forming of the middle molding part 3 of many molding shape is carried out to it, Such a middle molding part 3 carries in the formed interlayer sheet 5 to the punching device 6, In how to pierce the vacuum forming article which pierces in the periphery surplus portion 4 of the middle molding part 3, forms the edge 7 of predetermined width in the periphery of the middle molding part 3, and pierces the mold goods 8, The middle molding part 3 in the resin sheet 1 is located in the die-cutting crevice 18 of the bottom part 10 of the punching device 6, Pressing down and positioning the periphery surplus portion 4 between the middle molding parts 3 with the pusher 17 by descent of the punch 9, in the periphery surplus portion 4, a deer is cut and carried out with the

cutting edge 12, and the edge 7 of approximately regulated width is formed in the periphery of the mold goods 8.

[0003]

[Problem(s) to be Solved by the Invention]However, in such a method of piercing, Heat the resin sheet 1, carry out vacuum forming of the middle molding part 3 with the vacuum molding apparatus 2, and such an interlayer sheet 5 is carried in to the punching device 6, Position the middle molding part 3, perform die cutting, and In this case. If the transferring quantity of the interlayer sheet 5 is exact, it is good, but heat contraction produces the interlayer sheet 5, So that it may deer-make the edge 7 of predetermined width hard for the positioning set in the punching device 6 to be difficult, and to form in the periphery of the mold goods 8 and the edge 7 can fully be formed, The periphery surplus portion 4 will be formed broadly enough, it was easy to produce the poor molding of the mold goods 8 as a result, and there was a problem that the yield which obtains many mold goods 8 from the resin sheet 1 fell.

[0004]The place which this invention is made in view of such a problem, and is made into the purpose, The middle molding part in a punching device can be positioned correctly, the edge as predetermined can be formed in the periphery of mold goods, and it is in providing how to pierce the vacuum forming article which can raise the yield in the case of being many picking.

[0005]

[Means for Solving the Problem]With the vacuum molding apparatus 2, this invention separates a constant interval to the heated resin sheet 1, and carries out vacuum forming of the middle molding part 3 of many molding shape to it, and the interlayer sheet 5 in which a majority of such middle molding parts 3 were formed is carried in to the punching device 6, It is how to pierce a vacuum forming article which pierces in a periphery of the middle molding part 3, forms the edge 7 of predetermined width in a periphery of the middle molding part 3, and pierces the mold goods 8, The rear part 13 is formed in a periphery of the middle molding part 3, and the inclined plane 14 for positioning is fabricated by the rear part 13, Carry in to the punching device 6 the interlayer sheet 5 in which the middle molding part 3 was fabricated, and the blank 11 where the middle molding part 3 is stored by the punch 9 of the punching device 6 is formed, Hang to a periphery of the blank 11, the cutting edge 12 is formed, and the carrier crevice 15 which stores the rear part 13 is formed in the bottom part 10 of the punching device 6, Abbreviate to an angle of gradient of the above-mentioned inclined plane 14 for positioning, are in a side attachment wall of the carrier crevice 15, and the inclination abutment 16 of an angle of gradient is formed, The rear part 13 which the

carrier crevice 15 was made to face is pressed with the pusher 17, the inclined plane 14 for positioning is interviewed in the inclination abutment 16, and positioning of the middle molding part 3 is made by agreement with the rising wood 16A of the inclination abutment 16, and the rising wood 14A of the inclined plane 14 for positioning, and After that, The cutting edge 12 cuts.

[0006]

[Function]Thus, the rear part 13 is formed in the periphery of the middle molding part 3, and the inclined plane 14 for positioning is fabricated by the rear part 13, Carry in to the punching device 6 the interlayer sheet 5 in which the middle molding part 3 was fabricated, and the blank 11 where the middle molding part 3 is stored by the punch 9 of the punching device 6 is formed, Hang to the periphery of the blank 11, the cutting edge 12 is formed, and the carrier crevice 15 which stores the rear part 13 is formed in the bottom part 10 of the punching device 6, Abbreviate to the angle of gradient of the above-mentioned inclined plane 14 for positioning, are in the side attachment wall of the carrier crevice 15, and the inclination abutment 16 of an angle of gradient is formed, The rear part 13 which the carrier crevice 15 was made to face is pressed with the pusher 17, and the inclined plane 14 for positioning is interviewed in the inclination abutment 16, In the state where the rear part 13 was made to face the carrier crevice 15 of the bottom part 10 when positioning of the middle molding part 3 is made by agreement with the rising wood 16A of the inclination abutment 16, and the rising wood 14A of the inclined plane 14 for positioning. With descent of the punch 9, press the rear part 13 with the pusher 17, press the inclination abutment 16 for the inclined plane 14 for positioning as a guide surface, make the rising wood 14A of the inclined plane 14 for positioning contact the rising wood 16A of the inclination abutment 16, and the middle molding part 3 is positioned correctly, In such a positioning state, the cutting edge 12 can cut the edge 7 of predetermined width, the mold goods 8 as predetermined are obtained, and it can cut, without producing a position gap in this way, and the yield in the case of forming much mold goods 8 is raised.

[0007]

[Example]Working example of this invention is explained in full detail based on Drawings below. Drawing 1 shows the production process figure of the outline, with the vacuum molding apparatus 2, separates a constant interval to the heated resin sheet 1, and carries out vacuum forming of the middle molding part 3 of many molding shape to it. The vacuum molding apparatus 2 is opened for free passage by the bottom part 20 at a BAKYUUMU device, and the siphon 21 is opened for free passage by the suction hole 22. The periphery surplus portion 4 is formed in the periphery of the middle molding

part 3, the middle molding part 3 is this periphery surplus portion 4, and also vacuum forming is carried out to the periphery so that the rear part 13 may become a convex caudad, so that it may be formed in a rough plate shape and may become a convex in the upper part. The interlayer sheet 5 in which a majority of such middle molding parts 3 were formed is carried in to the punching device 6. In the periphery surplus portion 4 of the middle molding part 3, it pierces with the punching device 6, and the edge 7 of predetermined width is formed in the periphery of the middle molding part 3, and the mold goods 8 are pierced. The process and composition are explained in full detail below.

[0008]The inclined plane 14 for positioning is fabricated by the rear part 13 in the punching device 6. The blank 11 where the income of the middle molding part 3 is carried out to the punch 9 of the punching device 6 is formed. It hangs to the periphery of the blank 11 and the cutting edge 12 is formed. The carrier crevice 15 which stores the rear part 13 is formed in the bottom part 10 of the punching device 6. It abbreviates to the angle of gradient of the above-mentioned inclined plane 14 for positioning, and is in the side attachment wall of the carrier crevice 15, and the inclination abutment 16 of the angle of gradient is formed. A deer is carried out, the rear part 13 which the carrier crevice 15 was made to face is pressed with the pusher 17, the inclined plane 14 for positioning is interviewed in the inclination abutment 16, and positioning of the middle molding part 3 is made by agreement with the rising wood 16A of the inclination abutment 16, and the rising wood 14A of the inclined plane 14 for positioning. Then, the cutting edge 12 cuts the periphery surplus portion 4.

[0009]Thus, the rear part 13 of the periphery surplus portion 4 of the middle molding part 3 which serves as a convex in a counter direction is further formed in the middle molding part 3 at a periphery, The inclined plane 14 for positioning is fabricated by the rear part 13, and the interlayer sheet 5 is carried in to the punching device 6 so that the middle molding part 3 may become a convex in the upper part, The blank 11 where the income of the middle molding part 3 is carried out to the punch 9 of the punching device 6 is formed, Hang to the periphery of the blank 11, the cutting edge 12 is formed, and the carrier crevice 15 which stores the rear part 13 is formed in the bottom part 10 of the punching device 6, Abbreviate to the angle of gradient of the above-mentioned inclined plane 14 for positioning, are in the side attachment wall of the carrier crevice 15, and the inclination abutment 16 of an angle of gradient is formed, The rear part 13 which the carrier crevice 15 was made to face is pressed with the pusher 17, and the inclined plane 14 for positioning is interviewed in the inclination abutment 16, By positioning of the middle molding part 3 being made by agreement with the rising wood 16A of the inclination abutment 16, and the rising wood 14A of the inclined plane 14 for

positioning. In the state where the rear part 13 was made to face the carrier crevice 15 of the bottom part 10, with descent of the punch 9, press the rear part 13 with the pusher 17, and the inclination abutment 16 is pressed for the inclined plane 14 for positioning as a guide surface, In [ make the rising wood 14A of the inclined plane 14 for positioning contact the rising wood 16A of the inclination abutment 16, position the middle molding part 3 correctly, and ] such a positioning state, The cutting edge 12 can cut the periphery surplus portion 4 to predetermined width at the edge 7, the mold goods 8 as predetermined are obtained, and the yield in the case of forming much mold goods 8 is raised.

[0010]In above-mentioned working example, carried in the interlayer sheet 5 to \*\*\*\*\* 6 for the reverse sides so that it might become a convex about the middle molding part 3 in the upper part, but. The middle molding part 3 is fabricated so that it may become a convex caudad, and it may be made to carry in the interlayer sheet 5 to the punching device 6 public, as shown in drawing 5. Drawing 6 is put in a row to the middle molding part 3, carries out vacuum forming of the rear part 13 without showing other working example and forming the periphery surplus portion 4, and in the base of the inclined plane 14 for positioning, it cuts it with the cutting edge 12. That is, the inclined plane 14 for positioning of the rear part 13 serves on the inclination side attachment wall 8a of the mold goods 8. Drawing 7 shows working example of further others, loses the periphery surplus portion 4 also in this working example, forms the projected rim 13b in the horizontal piece 13a of the rear part 13 with the vacuum molding apparatus 2, and cuts it with the cutting edge 12 in this projected rim 13b. In this case, the shape of the cut edge cut with the cutting edge 12 has turned to the method lower part of outside, and the contamination of the wrap film for a package becomes easy. And there should just be height whose height h of the projected rim 13b is about 1-1.5 mm. In this case, the cutting edge 12 does not contact the inclined plane 14 for positioning on the occasion of the cutting.

[0011]

[Effect of the Invention]As for this invention, a rear part is formed in the periphery of a middle molding part as mentioned above, The interlayer sheet in which the inclined plane for positioning was fabricated by the rear part, and the middle molding part was fabricated is carried in to a punching device, The blank where a middle molding part is stored is formed in the punch of a punching device, and hang to the periphery of a blank and the cutting edge is formed, The carrier crevice which stores a rear part is formed in the bottom part of a punching device, and abbreviate to the angle of gradient of the above-mentioned inclined plane for positioning, are in the side attachment wall of a

carrier crevice, and the inclination abutment of an angle of gradient is formed, The rear part which the carrier crevice was made to face is pressed with a pusher, and the inclined plane for positioning is interviewed in an inclination abutment, Since positioning of a middle molding part is made by agreement with the rising wood of an inclination abutment, and the rising wood of the inclined plane for positioning, in the state where the rear part was made to face the carrier crevice of a bottom part. With descent of a punch, press a rear part with a pusher and an inclination abutment is pressed for the inclined plane for positioning as a guide surface, It can cut without making the rising wood of the inclined plane for positioning contact the rising wood of an inclination abutment, positioning a middle molding part correctly, the cutting edge's being able to cut the edge of predetermined width, obtaining the mold goods as predetermined in such a positioning state, and producing a position gap in this way, There is an advantage that the yield in the case of forming much mold goods can be raised.